

HAVE YOU SEEN MY MATE? DESCRIPTIONS OF UNKNOWN SEXES OF SOME NORTH AMERICAN SPECIES OF LINYPHIIDAE AND THERIDIIDAE (ARANEAE)

Nadine Dupéré: 341 15 ème rue, Laval, Québec, H7N 1L5, Canada. E-mail: dupere.nadine@videotrm.ca

Pierre Paquin¹: Department of Biology, San Diego State University, San Diego, California, 92812-4614, U.S.A. E-mail: paquinp@mlink.net

Donald J. Buckle: 620 Albert Avenue, Saskatoon, Saskatchewan, S7N 1G7, Canada

ABSTRACT. The previously unknown sexes of 13 species of Linyphiidae and Theridiidae are described and illustrated for the first time. These include the following members of the Linyphiidae: *Centromerus furcatus* (Emerton) female, *Cheniseo sphagnicultor* Bishop & Crosby female, *Colonus siou* Chamberlin male, *Dismodicus alticeps* Chamberlin & Ivie female, *Floricomus praedesignatus* (Bishop & Crosby) female, *Glyphesis idahoanus* (Chamberlin) male, *Gnathonaroides pedalis* (Emerton) female, *Lepthyphantes intricatus* (Emerton) female, *Scyletria inflata* Bishop & Crosby female, *Sisicus penifusifer* Bishop & Crosby female, *Walckenaeria clavipalpis* Millidge male; and two members of the Theridiidae: *Thymoites minnesota* Levi female and *Robertus crosbyi* (Kaston) male. Synonymy, new records, and comments on distribution, habitat and taxonomy are also given. The generic placement of *Glyphesis idahoanus* (Chamberlin) and *Glyphesis scopulifer* (Emerton) is confirmed.

Keywords: taxonomy, Canada, U.S.A., undescribed sexes, distribution, museum collection

Recently, Paquin & Dupérré (2003) published an identification guide to the known and suspected spiders of Québec. In the treatment of these species, we came across several for which only one sex was known. The other sex of these species is described below. We also give the synonymy, new distribution data and provide relevant taxonomic and ecological comments. The failure to recognize matching sexes may result in situations where a female is known under a certain name and the male under another, therefore leaving the false impression that only one sex is known. Such cases, however possible, are not common and for most species in which only one sex is known, there may be rather simple and direct explanations. Firstly, the species is quite rare and it happens that only one sex was collected. Secondly, differences in either microhabitat selection or behavior of males and females may result in one sex being overlooked. For instance, approximately one hundred males are known for *Maro amplus* Dondale & Buckle 2001, but so far, the female remains un-

known (Dondale & Buckle 2001). In other cases, such as *Nesticus* Thorell 1869 (Nesticidae), the ratio of specimens collected in the field largely favors females and juveniles while mature males are rarely encountered (M. Hedin pers. comm., pers. obs.). Similar observations were made by Gertsch (1992) for the genus *Cicurina* Menge 1871 (Dictynidae). Thirdly, in most cases the undescribed sex has been collected and properly assigned to a species but awaits formal description. Most species treated in this paper belong to this last category.

We have collected both sexes of some species [*Gnathonaroides pedalis* (Emerton 1923), *Centromerus furcatus* (Emerton 1882), *Lepthyphantes intricatus* (Emerton 1911), *Dismodicus alticeps* Chamberlin & Ivie 1947, *Scyletria inflata* Bishop & Crosby 1938, *Colonus siou* Chamberlin 1949, *Sisicus penifusifer* Bishop & Crosby 1938, *Thymoites minnesota* Levi 1964], in the same pitfall sample, or together in the field, thus allowing the association. Most other records were sorted together in vials belonging the Canadian National Collection. These associations were

¹ Corresponding author.

made over the years by C.D. Dondale and J.H. Redner from samples in which both sexes were collected together.

METHODS

Specimens were examined in 70% ethanol under a SMZ-U Nikon dissection microscope. A Nikon Coolpix 950 digital camera attached to the microscope was used to take a photograph of the structure. The digital photo was then used to trace proportions and the illustration was detailed and shaded by referring back to the structure under the microscope. Female genitalia were excised using a sharp entomological needle and transferred to lactic acid to clear non-chitinous tissues. A temporary lactic acid mount was used to examine the genitalia under an Olympus BX40 microscope, and was photographed and illustrated as explained above. All measurements were made using a micrometric ruler fitted on the eyepiece of the microscope. When available, 5 specimens were measured for the description. Calculation for the location of TmI follows Denis (1949).

Most of the specimens studied were from the Canadian National Collection of Insects and Arachnids, Ottawa, Canada (CNC). In addition, material from several other collections was examined. The collection is indicated in brackets and unless specified otherwise, the specimens are deposited in the CNC. Abbreviations used: AG = Collection of Alice Graham; CMB = Collection of C.M. Buddle; CPAD = Collection of Paquin-Dupérré; DJB = Collection of D.J. Buckle; DSU = Dickinson State University, North Dakota (currently at Texas A&M International University); HAC = Collection of H.A. Carcamo; MCZ = Museum of Comparative Zoology, Harvard University; MLC = Collection of Maxime Larivée; RF = Collection of Robert Fimbel; RGH = Collection of R.G. Holmberg; RPC = Collection of Roger Pickavance; RSM = Royal Saskatchewan Museum; UASM = University of Alberta, Strickland Museum. Latitude and longitude given for each locality should be considered approximate.

TAXONOMY

Family Linyphiidae Blackwall 1859

Genus *Centromerus* Dahl 1886

Centromerus furcatus (Emerton 1882)

Figs. 1–3

Microneta furcata Emerton 1882:76, pl. 24 fig. 5.

Centromerus furcatus (Emerton): van Helsdingen

1973:27, figs. 22–24; Jennings et al. 1988:61; Bélinger & Hutchinson 1992:50; Buckle et al. 2001:105; Paquin et al. 2001:16; Paquin & LeSage 2001:96; Paquin & Dupérré 2003:137, figs. 1503–1506.

Material examined.—U.S.A.: *Maine*: Piscataquis County Soubunge Mountain [45°58'N, 69°12'W], 1 ♂, 1 ♀ (CNC); *CANADA: Newfoundland*: Eastern Blue pond [50°27'N, 57°07'W], 1 ♂, 1 ♀ (CNC); Crabbes River [48°13'N, 58°52'W], 2 ♀ (CNC); Barachois Brook [48°27'N, 58°26'W], 1 ♀ (CNC); Lloyd's Lake [48°23'N, 57°31'W], 2 ♀ (CNC); Highlands River [48°11'N, 58°53'W], 1 ♀ (CNC); Big Falls [47°05'N, 54°03'W], 1 ♀ (CNC); Pasadena [49°01'N, 57°36'W], 1 ♂, 6 ♀ (CNC); *New Brunswick*: Green River 30 mi N Edmunston [47°19'N, 65°27'W], 2 ♂ (CNC); *Québec*: Parc de la Gaspésie Mont Albert [48°56'N, 66°10'W], 1 ♀ (CNC); 24 mi S of Ste-Anne-des-Monts [48°52'N, 65°58'W], 3 ♂ (CNC); Abitibi Lac Duparquet [48°30'N, 79°13'W], 1 ♂, 1 ♀ (CPAD).

Description.—*Female* ($n = 5$): Total length: 1.35 ± 0.08 mm; carapace length: 0.63 ± 0.03 mm; carapace width: 0.47 ± 0.02 mm; carapace smooth, shiny, light yellow to yellow with a tinge of orange, lightly shaded with gray along radiating lines; carapace margin more strongly shaded, 3–4 erect setae along midline; sternum yellow, strongly shaded with gray, margin darker. Chelicerae yellow with a tinge of orange, promargin with 3 large teeth, retromargin with 5 denticles. Cheliceral stridulatory organ not visible with stereomicroscope. Abdomen unicolor, off-white, lightly suffused with gray, densely covered with long semi-erect setae. Legs light yellow to yellow with a tinge of orange, tibia I–IV with two dorsal macrosetae; metatarsus I with dorsal trichobothrium, TmI 0.28–0.33, TmIV absent. Epigynal plate flat, protruding, wider than long; scape short, broad, straight or widening slightly toward the tip, cochlear present (Figs. 1, 2); spermathecae bean-shaped (Fig. 3).

Distribution.—Eastern species, southernmost record from New Hampshire (Buckle et al. 2001).

Habitat.—Collected in coniferous habitat, in moss and forest litter.

Genus *Cheniseo* Bishop & Crosby 1935
Cheniseo sphagnicultor Bishop & Crosby
 1935

Figs. 4, 5

Cheniseo sphagnicultor Bishop & Crosby 1935a:
 263, pl. 21 figs. 64–69; Buckle et al. 2001:110;
 Paquin et al. 2001:16; Paquin & Dupérré 2003:
 96, figs. 883–886.

Acartauchenius sphagnicultor (Bishop & Crosby):
 Aitchison-Benell & Dondale 1992:221; Dondale
 & Redner 1994:36; Bélanger & Hutchinson 1992:
 22.

Material examined.—CANADA: *Nova Scotia*: Cape Breton National Park French Lake [46°44'N, 60°52'W], 1 ♀ (CNC); Cape Breton National Park North Mount [46°53'N, 60°35'W], 2 ♂ (CNC); *Québec*: Gatineau Park Hopkin's Hole [45°34'N, 75°57'W], 1 ♂ (CNC); *Ontario*: Alfred [45°33'N, 76°52'W], 1 ♂, 1 ♀ (CNC); Mer Bleu 8 miles E. of Ottawa [45°24'N, 75°30'W], 8 ♂, 3 ♀ (CNC); Upper Rock Lake 30 km N Kingston [44°30'N, 76°24'W], 1 ♂ (CNC); Crieff Bog 3 km W Puslinch [43°26'N, 80°05'W], 1 ♂ (CNC); Wylde Lake Bog 8 km E Arthur [43°50'N, 80°22'W], 7 ♂, 1 ♀ (CNC); Brucedale conservation area nr Port Elgin [44°26'N, 81°24'W], 1 ♀ (CNC); *Manitoba*: Riding Mountain National Park Swanson Spring [50°53'N, 100°15'W], 6 ♂, 1 ♀ (CNC).

Description.—*Female* ($n = 5$): Total length: 0.98 ± 0.07 mm; carapace length: 0.43 ± 0.05 mm; carapace width: 0.33 ± 0.04 mm; carapace smooth, shiny, light brown to dark brown, radiating lines and carapace margin with diffuse gray pattern, cephalic region occasionally ornamented by a dark gray marking forming a trident (or psi, Ψ); 3 long erect setae along midline; sternum light brown to dark brown strongly shaded with gray. Chelicerae yellow to light brown, promargin with 1 large tooth and 5 small teeth, retromargin with 4–5

denticles. Cheliceral stridulatory organ not visible with stereomicroscope. Abdomen unicolor, light to dark gray, densely covered with short semi-erect setae. Legs light yellow with a tinge of orange, tibia I–IV with one dorsal macroseta; metatarsus I with dorsal trichobothrium, TmI 0.38–0.47, TmIV absent. Epigynum with plate resembling an hexagon; median lobe, broad, pointed, extending in pale area; copulatory openings small, round, situated at anterior end of the median lobe (Fig. 4); spermathecae round, widely separated, flanking the median lobe (Figs. 4, 5).

Distribution.—Species restricted to the eastern portion of North America, W to Manitoba.

Habitat.—This species has been collected in coniferous forest litter but seems mainly associated with sphagnum bogs.

Genus *Colonus* Chamberlin 1949

Colonus siou Chamberlin 1949

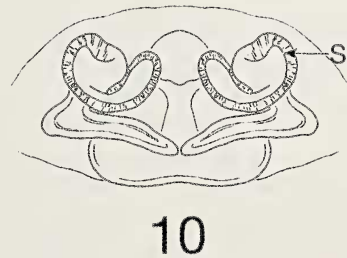
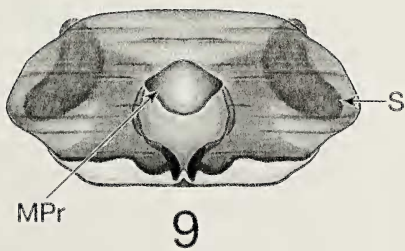
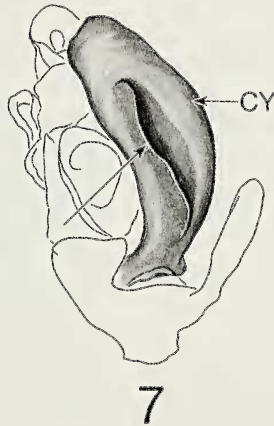
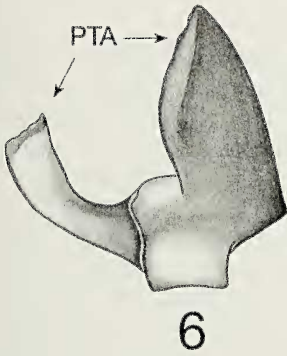
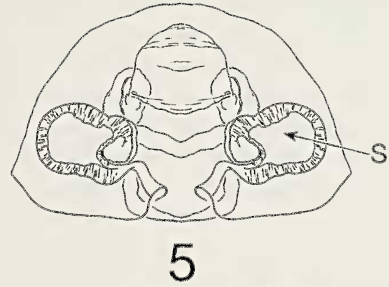
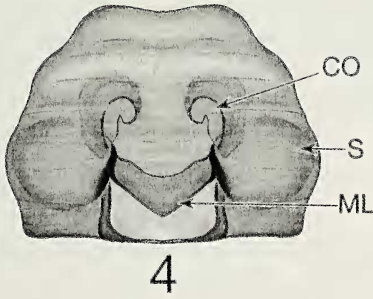
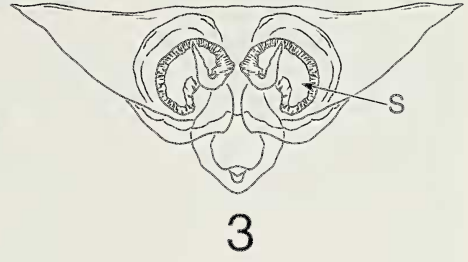
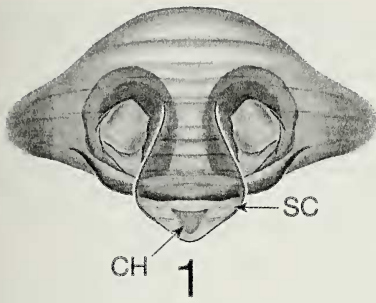
Figs. 6–8

Colonus siou Chamberlin 1949:525 figs. 48, 49; Levi & Levi 1955:36; Bélanger & Hutchinson 1992:27; Buckle et al. 2001:110; Paquin et al. 2001:16; Paquin & Dupérré 2003:97, figs. 891–893.

Material examined.—U.S.A.: *Massachusetts*: Barnstable County: Quisset [41°43'N, 70°39'W], 10 ♂, 8 ♀ (CNC); *North Dakota*: Dunn County: Lake Ilo [47°20'N, 102°39'W], 1 ♂ (DSU); Canada: *Québec*: Gatineau Park King Mountain [45°29'N, 75°52'W], 1 ♂ (CNC); *Saskatchewan*: 10 km S Cadillac [49°30'N, 107°50'W], 22 ♂, 4 ♀ (RSM); Grasslands National Park West Block [49°07'N, 107°26'W], 55 ♂, 27 ♀ (DJB); North Battleford [52°47'N, 108°17'W], 5 ♂, 2 ♀ (DJB); Morse [50°30'N, 106°53'W], 15 ♂, 2 ♀ (RSM); 22 km W Hazlet [50°24'N, 108°36'W], 1 ♂ (RSM); 5 mi NE Saskatoon [52°11'N, 106°34'W], 18 ♂ (DJB); 21 km N Scotsguard [49°43'N, 108°09'W], 1 ♂ (RSM);

→

Figures 1–10.—Linyphiid genitalic structures: 1–3. *Centromerus furcatus*: 1. Epigynum, ventral view; 2. Epigynum, lateral view; 3. Spermathecae, dorsal view. 4, 5. *Cheniseo sphagnicultor*: 4. Epigynum, ventral view; 5. Spermathecae, dorsal view. 6–8. *Colonus siou*: 6. Palpal tibia of male, dorsal view; 7. Palpal cymbium, lateral view; 8. Palpus of male, ventral view. 9, 10. *Dismodicus alticeps*: 9. Epigynum, ventral view; 10. spermathecae, dorsal view. Abbreviations used: CH = Cochlea, CO = Copulatory Opening, CY = Cymbium, E = Embolus, ML = Median Lobe, MPr = Median Process, PTA = Palpal Tibia Apophysis, SC = Scape, S = Spermatheca.



24 km N Shaunavon [49°53'N, 108°30'W], 7 ♂, 1 ♀ (RSM); ~10 km NE Simmie [49°59'N, 108°00'W], 9 ♂, 1 ♀ (RSM); *Alberta*: Lethbridge [49°42'N, 112°49'W], 2 ♂ (DJB); Suffield [50°12'N, 111°10'W], 25 ♂, 6 ♀ (DJB).

Description.—*Male* ($n = 5$): Total length: 1.58 ± 0.11 mm; carapace length: 0.66 ± 0.03 mm; carapace width: 0.54 ± 0.04 mm; carapace smooth, shiny, light brown to brown with diffused gray markings along midline and radiating line, carapace margin with dark gray markings; 6 short erect setae along midline; sternum brown strongly shaded with gray, margin darker. Chelicerae yellow to light brown, paler basally and apically, promargin with 3 large teeth and 1 small tooth, retro-margin with 2 small teeth. Cheliceral stridulatory organ easily visible with ~20 ridges. Abdomen unicolor, dark gray, sparsely covered with long erect setae. Legs light yellow with a tinge of brown, coxae lightly shaded with gray; tibia I-IV with one dorsal macroseta; metatarsus I with dorsal trichobothrium, TmI 0.40–0.48, TmIV absent. Palpal tibia with two apophyses (Fig. 6); cymbium with large, deep, longitudinal, retrolateral groove (Fig. 7); paracymbium concealed behind palpal tibia apophysis; embolus flat, ribbon like, curving twice at almost a right angle (Fig. 8).

Distribution.—Apparently a northern species. It has been found from Alberta to Québec to the North and in North Dakota and Massachusetts (Buckle et al. 2001).

Habitat.—This species appears to inhabit forest litter and moss in the east of its distribution, and prairie in the west.

Remarks.—Five species are listed in the genus *Coloncus* (Buckle et al. 2001). One species, *C. americanus*, was described by Chamberlin & Ivie (1944), the remaining by Chamberlin (1949). Four of these species were described from females only and appear very similar based on available illustrations. *Coloncus cascadeus* Chamberlin 1949 was briefly described from both male and female, but no illustrations of the genitalia were provided. The description and illustration of the male of *Coloncus siou* given here will hopefully bring attention to the genus and result in a re-examination of the five species, which may prove to be synonyms. On the other hand, *C. siou* is associated with forest and moss in the East, but specimens collected in Saskatche-

wan, Alberta, Montana and North Dakota are found in prairie habitats (Buckle unpub.). It is presently unclear whether this indicates a broad habitat selection for *C. siou*, or that more than one species is present. A revision of the genus is necessary to clarify these questions. The name *Coloncus siou* has been used for the species found in the East to remain consistent with Buckle et al. (2001).

As mentioned in Buckle et al. (2001) and Paquin et al. (2001), the date of Chamberlin's paper "On some American spiders of the Family Erigonidae" is erroneously cited as 1948. The paper was published in 1949 as stated on page 570 of the volume 41 of the *Annals of the Entomological Society of America*.

Genus *Dismodicus* Simon 1884

Dismodicus alticeps Chamberlin & Ivie 1947
Figs. 9, 10

Dismodicus alticeps Chamberlin & Ivie 1947:34 figs. 29–31; Hackman 1954:28, figs. 69–71; West et al. 1984:86; Bélanger & Hutchinson 1992:28; Aitchison-Benell & Dondale 1992:222; Marusik et al. 1993:76; Hutchinson 1994:168; Dondale et al. 1997:83; Buckle et al. 2001:112. Paquin et al. 2001:17; Paquin & Dupérré 2003:99, figs. 918–921.

Material examined.—U.S.A.: *North Dakota*: Benson County: Wood Lake [47°54'N, 98°53'W], 1 ♂, 2 ♀ (DSU); Bottineau County [County record only], 1 ♂, 2 ♀ (DSU); Rolette County [County record only], 1 ♀ (DSU); Rolette County: Fish Lake [48°06'N, 99°33'W], 1 ♂ (DSU); *CANADA*: *Newfoundland*: Noel Pauls Brook [48°49'N, 56°18'W], 1 ♀ (CNC); *Nova Scotia*: Cape Breton Highlands National Park North of Paquet Lake [46°48'N, 60°41'W], 4 ♂ (CNC); Cape Breton Highlands National Park New Ross Lunenburg County [44°44'N, 64°27'W], 2 ♂ (CNC); Cape Breton Highlands National Park Sweet's Cove [44°44'N, 64°27'W], 1 ♂, 12 ♀ (CNC); Hebbleville [44°21'N, 64°32'W], 2 ♀ (CNC); Cape Blomidon [45°13'N, 64°22'W], 1 ♀ (CNC); Kentville [45°05'N, 64°30'W], 3 ♀ (CNC); *New Brunswick*: Fredericton Lincoln [45°54'N, 66°35'W], 2 ♀ (CNC); Green River 30 mi N Edmunston [47°19'N, 68°09'W], 1 ♀ (CNC); Kouchibouguac National Park [46°51'N, 64°58'W], 4 ♀ (CNC); *Québec*: Lac Roddick [46°15'N, 75°53'W], 1 ♀ (CNC); La Rivière-du-Nord, Saint-Hippolyte, Station

biologie Université de Montréal [45°59'N, 74°00'W], 4 ♂, 4 ♀ (CPAD); *Ontario*: Shirleys Bay 15 km w of Ottawa [45°22'N, 75°53'W], 1 ♀ (CNC); Algonquin Provincial Park Lake Opeongo [45°42'N, 78°23'W], 3 ♂, 6 ♀ (CNC); Algonquin Provincial Park Lake Opeongo Deer Island [45°42'N, 78°23'W], 5 ♀ (CNC); Petawawa [45°54'N, 77°20'W], 2 ♂, 3 ♀ (CNC); Iroquois Falls [48°46'N, 80°41'W], 1 ♀ (CNC); *Manitoba*: Riverton [50°59'N, 96°59'W], 14 ♂, 22 ♀ (CNC); 15 km SW Swan River [51°58'N 101°W], 2 ♀ (DJB); South Indian Lake [56°47'N, 98°56'W], 1 ♀ (CNC); Seddon's Corner [50°03'N, 96°17'W], 4 ♀ (CNC); Pine Falls [50°33'N, 96°13'W], 1 ♂, 5 ♀ (CNC); Rennie [49°51'N, 95°33'W], 2 ♂, 2 ♀ (CNC); Agassiz Provincial Park [49°59'N, 96°09'W], 3 ♀ (CNC); Telford [49°50'N, 95°23'W], 1 ♂, 3 ♀ (CNC); Darwin [49°55'N, 95°49'W], 4 ♂, 4 ♀ (CNC); Glenlea [49°38'N, 97°08'W], 1 ♀ (CNC); Eardley Lake [52°31'N, 96°06'W], 1 ♀ (CNC); Spuce Woods Provincial Forest [49°46'N, 99°21'W], 3 ♀ (CNC); Ninette [49°20'N, 99°33'W], 1 ♂ (CNC); Riding Mountain National Park [50°39'N, 99°58'W], 1 ♀ (CNC); *Saskatchewan*: Lady Lake [52°02'N, 102°37'W], 4 ♂, 3 ♀ (DJB, RGH); Anglin Lake [53°44'N, 105°56'W], 3 ♂, 2 ♀ (DJB); Fort Carlton [52°52'N, 106°32'W], 1 ♀ (DJB); Besnard Lake [55°25'N, 106°00'W], 1 ♂, 2 ♀ (DJB); *Alberta*: Winfield [52°58'N, 114°26'W], 2 ♀; Fox Lake Reservation [58°26'N, 114°33'W], 1 ♂, 1 ♀ (DJB); Wenzel Lake [59°02'N, 114°28'W], 2 ♂, 1 ♀ (UASM); Steele Lake [54°40'N, 113°38'N], 2 ♂ (DJB); Athabasca [54°43'N, 113°17'W], 1 ♀ (DJB); Baptiste Lake [54°45'N, 113°35'W], 1 ♂, 2 ♀ (DJB); Marguerite Crag and Tail Provincial Park [57°43'N, 110°20'W], 1 ♀ (UASM); 90 km NW Peace River [56°42'N, 118°29'W], 2 ♀ (DSU); *British Columbia*: Little Prairie Lake [54°57'N, 120°11'W], 1 ♀ (CNC); Babine Lake Johnson Bay [54°45'N, 126°00'W], 9 ♀ (CNC); Atlin [59°34'N, 133°42'W], 2 ♀ (CNC); *Northwest Territory*: Martin River [61°55'N, 121°34'W], 1 ♀ (CNC); Maunoir Lake [67°29'N, 124°55'W], 1 ♀ (CNC); Wrigley [63°16'N, 123°36'W], 2 ♂, 2 ♀ (CNC); *Yukon Territories*: Kathleen Lake Kluane National Park [60°34'N, 137°17'W], 5 ♀ (CNC); Gravel Lake 58 mi E Dawson [63°48'N, 137°53'W], 2 ♀ (CNC); 13 mi E Dawson [64°03'N, 139°25'W], 2 ♀

(CNC); Old Crow [67°35'N, 137°53'W], 1 ♂, 2 ♀ (CNC).

Description.—*Female* ($n = 5$): Total length: 2.14 ± 0.46 mm; carapace length: 0.86 ± 0.09 mm; carapace width: 0.67 ± 0.05 mm; carapace smooth, shiny, yellow to light orange, radiating lines light brown, cephalic region of the carapace occasionally ornamented by a gray marking forming a trident (or psi, Ψ); 5 short erect setae along midline; sternum yellow to light orange with dusky gray margins. Chelicerae yellow to light orange, promargin with 4 large teeth, retromargin with 3–4 large teeth; cheliceral stridulatory organ not visible with stereomicroscope. Abdomen unicolor, gray to dark gray, densely covered with semi-erect setae. Coxae, femora and patella yellow to light orange, tibia, metatarsi and tarsi light orange to dark brown, tibia I–IV with one dorsal macroseta; metatarsus I with dorsal trichobothrium, TmI 0.68–0.82, TmIV present. Epigynum with plate distinctly wider than long, posterior end of plate rising and recurving into a median process, tapered toward midline (Fig. 9); spermathecae c-shaped, beanlike, widely separate, situated near the anterior end of the epigynal plate (Figs. 9, 10).

Distribution.—Widespread species, apparently boreal.

Habitat.—This species has been recorded from several habitats, but mainly on coniferous vegetation and in forest litter.

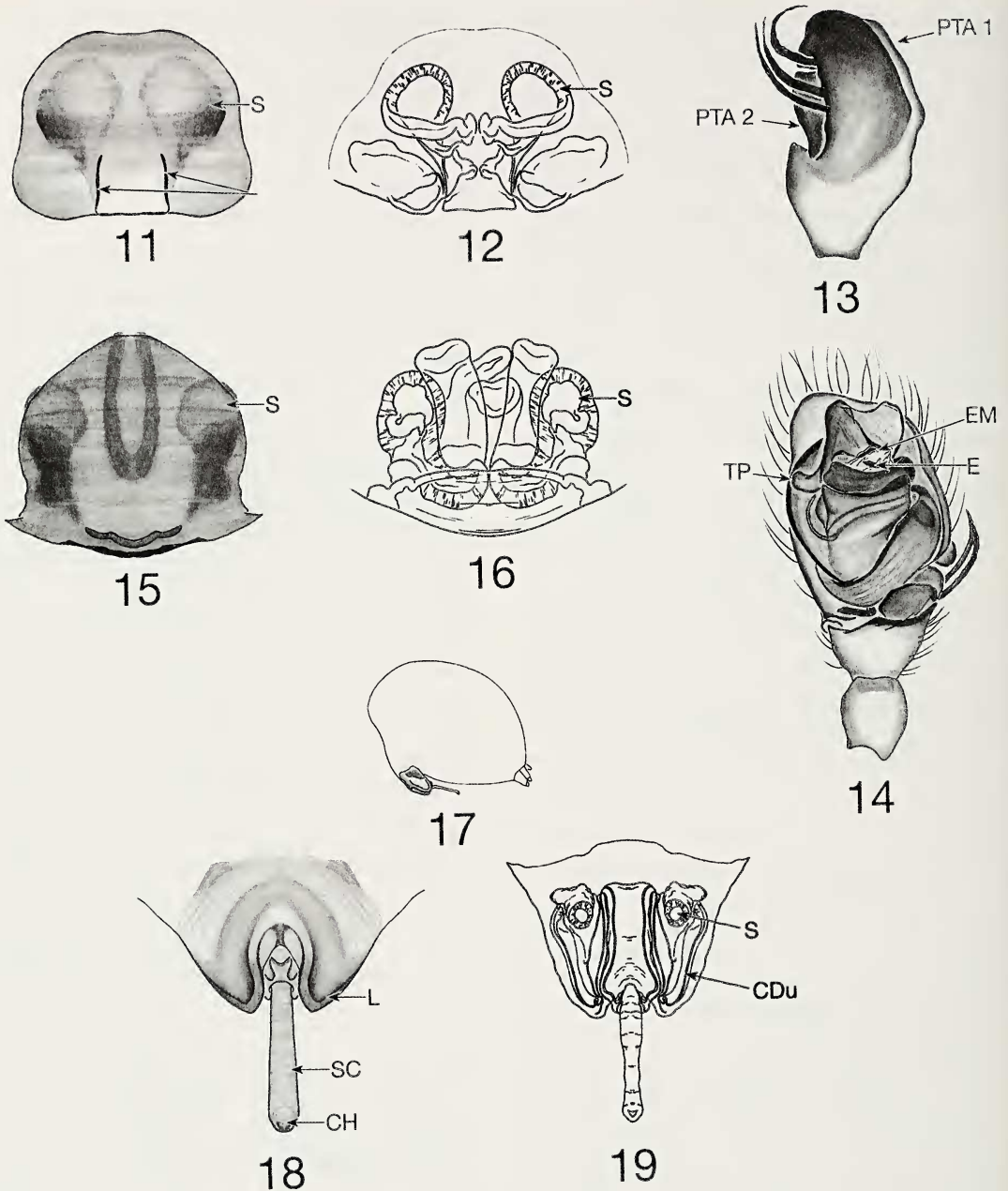
Genus *Floricomus* Bishop & Crosby 1925
Floricomus praedesignatus Bishop & Crosby
1935

Figs. 11, 12

Floricomus praedesignatus Bishop & Crosby 1935b:38, pl. 6 figs. 22–24; Hormiga 1994:32 figs. 19e, f; Bélanger & Hutchinson 1992:31; Buckle et al. 2001:119; Paquin et al. 2001:17; Paquin & Dupérré 2003:105, figs. 1042–1045.

Material examined.—U.S.A.: *North Carolina*: Jackson County: Blue Ridge Park [36°53'N, 80°95'W], 1 ♂ (CNC); CANADA: *Québec*: Pink Lake Gatineau Park [45°28'N, 75°48'W], 1 ♀ (CNC).

Description.—*Female* ($n = 1$): Total length: 1.39 mm; carapace length: 0.58 mm; carapace width: 0.50 mm; carapace smooth, shiny, cephalic region and cervical groove dark brown shaded with gray; thoracic region light brown with radiating line slightly shaded with gray; carapace margin strongly shaded;



Figures 11-19.—Linyphiid structures: 11, 12. *Floricomus praedesignatus*: 11. Epigynum, ventral view; 12. Spermathecae, dorsal view. 13, 14. *Glyphesis idahoanus*: 13. Palpal tibia of male, dorsal view; 14. palpus of male, ventral view. 15, 16. *Gnathonaroides pedalis*: 15. Epigynum, ventral view; 16. Spermathecae, dorsal view. 17-19. *Lepthyphantes intricatus*: 17. Abdomen, lateral view; 18. Epigynum, ventral view; 19. Spermathecae, dorsal view. Abbreviations used: CH = Cochlea, CDu = Copulatory Ducts, E = Embolus, EM = Embolic Membrane, L = Lobe, PTA = Palpal Tibia Apophysis, SC = Scape, S = Spermatheca, TP = Tail Piece.

sternum dark brown suffused with gray, margin darker. Chelicerae light brown, promargin with 1 large tooth and 5 small teeth, retromargin with 5 denticles. Cheliceral stridulatory organ not visible with stereomicroscope. Abdomen unicolor, dark gray, densely covered with semi-erect setae. Legs light orange with a tinge of brown, tibia I without dorsal macrosetae, tibia II-IV with one such seta; metatarsus I with dorsal trichobothrium, TmI 0.45; TmIV absent. Epigynum with plate inconspicuous, slightly convex, bearing two longitudinal fissures (Fig. 11); spermathecae rounded, and separated by less than half of their width (Figs. 11, 12).

Distribution.—Based on the few records known, this is an eastern species.

Habitat.—*Floricomus praedesignatus* has been collected in forest litter.

Genus *Glyphesis* Simon 1926

Glyphesis idahoanus (Chamberlin 1949)

Figs. 13, 14

Tapinocyba idahoana Chamberlin 1949:551 figs. 129, 130; West et al. 1988:82.

Glyphesis idahoana (Chamberlin): Aitchison-Benell & Dondale 1992:222; Bélanger & Hutchinson 1992:31; Dondale & Redner 1994:37.

Glyphesis idahoanus (Chamberlin): Buckle et al. 2001:119; Paquin et al. 2001:17; Paquin & Dupérré 2003:106, figs. 1050–1052.

Material examined.—CANADA: *Québec*: Les Buissons [49°06'N, 68°23'W], 1 ♀ (CNC); Lac Roddick [46°15'N, 75°53'W], 5 ♂, 2 ♀ (CNC); *Ontario*: Richmond [45°11'N, 75°50'W], 1 ♀ (CNC); Schaffeys Locks [44°35'N, 76°19'W], 1 ♀ (CNC); ~10 km W Carleton Place [45°08'N, 76°09'W], 1 ♂, 2 ♀ (CNC); Alfred [45°33'N, 76°52'W], 1 ♀ (CNC); *Manitoba*: Dauphin [51°09'N, 100°03'W], 1 ♂ (CNC); *Saskatchewan*: Grasslands National Park West Block [49°07'N, 107°26'W], 1 ♂ (DJB); *British Columbia*: Oliver [49°11'N, 119°33'W], 2 ♀ (CNC).

Description.—*Male* ($n = 5$): Total length: 1.32 ± 0.09 mm; carapace length: 0.51 ± 0.03 mm; carapace width: 0.47 ± 0.03 mm; carapace smooth, shiny, dark brown with radiating line and margin strongly shaded with gray, cephalic region ornamented by a dark gray inverse pear shape marking, 3 long erect setae along midline; sternum dark brown strongly shaded with gray. Chelicerae yellow to light

brown, promargin with 3 large and 2 small teeth, retromargin with 4 denticles. Cheliceral stridulatory organ not visible with stereomicroscope. Abdomen unicolor, dark gray, densely covered with short semi-erect setae. Legs yellow, coxae lightly shaded with gray, tibia I-IV with one dorsal macroseta; metatarsus I with dorsal trichobothrium, TmI 0.44–0.48, TmIV absent. Palpal tibia with one cup-like apophysis, dark brown to black, long, broad with 3 thick serrate setae (Fig. 13); second apophysis black, short, half hidden behind the cuplike apophysis; tail piece rather small, rounded; embolus thick, stout, hidden behind embolic membrane (Fig. 14).

Distribution.—Widespread species in Canada: from British to Quebec (Buckle et al. 2001).

Habitat.—This species has been recorded from litter near ponds, sphagnum and salt marshes.

Remarks.—This species was originally placed in the genus *Tapinocyba* Simon 1884 by Chamberlin (1949:551) based on the female genitalia. In defining the genus *Glyphesis*, Simon (1926:350) gave a diagnostic feature in the male palpal tibia bearing several strong setae (see Simon 1926, fig. 605). The male of *T. idahoana* has the same character as that illustrated by Simon for the type species *G. servulus* (Simon 1881). The species was placed in *Glyphesis* by Aitchison-Benell & Dondale (1992), without indication that this was a new combination, and subsequent authors have followed this placement. The examination and illustration of the male palp of the species confirm the generic placement in *Glyphesis*, along with *Glyphesis scopulifer* (Emerton 1882), which has the same tibial character (see Paquin & Dupérré 2003:106, fig. 1054). Holm (1968) proposed that *G. scopulifer* was a junior synonym of *G. servulus* (the type species), but this synonymy has been rejected (Buckle et al. 2001).

Genus *Gnathonaroides* Bishop & Crosby
1938

Gnathonaroides pedalis (Emerton 1923)

Figs. 15, 16

Araeoncus pedalis Emerton 1923:239, fig. 2.

Gnathonaroides pedale (Emerton): Jennings et al. 1988:61, Peck 1988:1202, Bélanger & Hutchinson 1992:32.

Gnathonaroides pedalis (Emerton): Bishop & Cros-

by 1938:84, pl. 6 figs. 65, 66; Levi & Field 1954: 447; Buckle et al. 2001:120; Paquin et al. 2001: 17; Paquin & Dupérré 2003:106, figs. 1056–1058.

Material examined.—U.S.A.: *New Hampshire*: Somersworth [43°15'N, 70°51'W], 1 ♂ (CNC); *Vermont*: Mounts Mansfield [44°32'N, 72°48'W], 2 ♂ (CNC); *Maine*: Piscataquis County: Soubunge Mountain [45°58'N, 69°12'W], 1 ♂ (CNC); CANADA: *Nova Scotia*: Cape Breton Highland National Park Lone Shieling [46°48'N, 60°57'W], 1 ♂ (CNC); Bridgewater [49°17'N, 122°54'W], 10 ♂ (CNC); *New Brunswick*: Acadia forest 10 mi E of Fredericton [45°56'N, 66°40'W], 5 ♂ (CNC); Kouchibouguac National Park [46°51'N, 64°58'W], 1 ♀ (CNC); *Québec*: Lac Roddick [46°15'N, 75°53'W], 1 ♂ (CNC); Mont-Albert, La Haute-Gaspésie, Parc de la Gaspésie, Ruisseau Cap Seize [48°59'N, 66°21'W], 1 ♂ (CNC); Maskinongé, Sainte-Angèle-de-Prémont [46°21'N, 73°03'W], 1 ♂ (CNC); Drummondville [45°53'N, 72°29'W], 1 ♀ (CNC); Lac Duparquet Abitibi [48°30'N, 79°13'W], 3 ♂, 3 ♀ (CPAD); *Ontario*: 7 km W Carleton Place [45°08'N, 76°09'W], 4 ♂ (CNC); Eastman Farm Chatterton [44°15'N, 77°29'W], 4 ♂ (CNC); El Dorado Gold Mine [44°45'N, 78°06'W], 1 ♂ (CNC); Guelph [43°33'N, 80°15'W], 1 ♂ (CNC); Ancaster [43°13'N, 79°59'W], 2 ♂, 1 ♀ (CNC); Rait [48°50'N, 89°56'W], 1 ♂ (CNC); *Manitoba*: Onanole [50°37'N, 99°58'W], 3 ♂, 1 ♀ (CNC); Riding Mountain National Park Clear Lake [50°40'N, 100°00'W], 1 ♂ (CNC); *Saskatchewan*: Lady Lake [52°02'N, 102°37'W], 1 ♂ (DJB); *Alberta*: Edmonton [53°33'N, 113°20'W], 3 ♂ (DJB); George Lake 16 km W Busby [53°57'N, 114°06'W], 1 ♂ (CMB).

Description.—*Female* ($n = 3$): Total length: 1.19 ± 0.13 mm; carapace length: 0.56 ± 0.05 mm; carapace width: 0.40 ± 0.05 mm; carapace smooth, shiny, light yellow, cephalic region light yellow with a tinge of orange, radiating lines and midline with diffused gray patterns; 5 long erect setae along midline; sternum yellow shaded lightly with gray, margin darker. Chelicerae yellow to light brown, promargin with 4 large teeth and 1 small tooth, retromargin with 5 denticles. Cheliceral stridulatory organ not visible with stereomicroscope. Abdomen unicolor, off-white, densely covered with long semi-erect setae.

Legs yellow with a tinge of orange, tibia I-III with two dorsal macrosetae and tibia IV with one dorsal seta; metatarsus I with dorsal trichobothrium, TmI 0.35–0.38, TmIV absent. Epigynal plate conspicuous, somewhat pentagonal, with two longitudinal dark bands converging below the middle of the plate, transversal band present near the posterior margin; posterior margin darker, more sclerotized (Fig. 15); spermathecae rounded, widely separated, situated at edge of lateral margin (Figs. 15, 16).

Distribution.—*Gnathonaroides pedalis* occurs in northern North America east of the Rockies. Buckle et al. (2001) report the species from New York and Maine.

Habitat.—This species has been found in various habitats including fields and grass, but it is mainly associated with forest litter, spruce litter and duff. Specimens from Lac Duparquet (Abitibi, Québec) have been collected under snow during winter.

Remarks.—External characters of the epigynum of *G. pedalis* are quite subtle and difficult to recognize. Thus, it is not surprising that the female has not been described as it has probably been classified in many collections as 'undet. Linyphiidae'.

Genus *Lepthyphantes* Menge 1866

Lepthyphantes intricatus (Emerton 1911)

Figs. 17–19

Microneta complicata Banks 1892:47, pl. 2, fig. 50 (preoccupied by *Lepthyphantes complicata* Emerton 1911); Banks 1916:77, pl. 10, fig. 14; Levi & Field 1954:446, figs. 22, 23 (male; not female, = *Centromerus cornupalpis*).

Bathypantes intricata Emerton 1911:397, pl. 3 figs. 7, 7a–d.

Centromerus intricatus (Emerton): Freitag et al. 1969:1329.

Lepthyphantes intricatus (Emerton): Ivie 1969:6; van Helsdingen 1973:7 (synonymy with *Microneta complicata* Banks 1892); Koponen 1987: 285; West et al. 1988:79; Jennings et al. 1988:61; Bélanger & Hutchinson 1992:53; Aitchison & Sutherland 2000:638, 644; Buddle et al. 2000: 427–431; Buckle et al. 2001:128; Paquin et al. 2001:18; Paquin & LeSage 2001:98; Paquin & Dupérré 2003:141, figs. 1559–1561.

Material examined.—U.S.A.: *Maine*: Piscataquis County: Soubunge Mountain [45°58'N, 69°12'W], 1 ♂ (CNC); *Montana*: 5 mi N Whitefish [48°24'N, 114°20'W], 1 ♂, 2 ♀ (DJB); *New Mexico*: Los Alamos [35°51'N,

106°18'W], 1 ♂ (DJB); *New York*: Hamilton County: ~10 km ESE Brandreth [43°56'N, 74°51'W], 4 ♂, 2 ♀ (RF); *CANADA*: *New Brunswick*: Green River 30 mi N Edmunston [47°19'N, 68°09'W], 1 ♂, 3 ♀ (CNC); *New Scotia*: Cape Breton Highlands National Park [46°48'N, 60°57'W], 3 ♂ (CNC); Cape Breton Highlands National Park Lone Shieling [46°48'N, 60°57'W], 2 ♂, 2 ♀ (CNC); Cape Breton Highlands National Park MacKenzie Mountain [46°46'N, 60°49'W], 3 ♂, 1 ♀ (CNC); Cape Breton Highlands National Park North Mountain [46°53'N, 60°35'W], 4 ♂, 14 ♀ (CNC); Cape Breton Highlands National Park Paquet Lake [46°48'N, 60°41'W], 3 ♂, 1 ♀ (CNC); *Ontario*: Fathom Five National Park Bear Rump Island [45°17'N, 81°40'W], 1 ♂ (CMB); 30 mi E Dryden [49°47'N, 92°45'W], 1 ♂ (CNC); Grundy provincial Park [45°56'N, 80°32'W], 1 ♀ (CNC); 56 mi N Hurket [49°20'N, 88°53'W], 1 ♀ (CNC); 20 mi E Kenora [49°49'N, 94°26'W], 2 ♂ (CNC); Long Point Squires Ridge [42°34'N, 80°15'W], 1 ♀ (CNC); 75 mi W Marathon [48°52'N, 87°35'W], 1 ♂ (CNC); 22 mi S Pickle Lake [51°28'N, 90°12'W], 1 ♀ (CNC); Raith [48°50'N, 89°56'W], 1 ♂ (CNC); Spencerville [44°51'N, 75°33'W], 1 ♀ (CNC); Tillsonburg [42°51'N, 80°44'W], 1 ♀ (CNC); Turkey Point [42°42'N, 80°19'W], 1 ♀ (CNC); Walsingham [42°41'N, 80°32'W], 1 ♂ (CNC); Wawa [47°59'N, 84°47'W], 6 ♂, 25 ♀ (CNC); *Québec*: Gatineau Park King Mountain [45°29'N, 75°52'W], 1 ♂, 3 ♀ (CNC); Lac Roddick [46°15'N, 75°53'W], 1 ♀ (CNC); 24 mi S Ste-Anne-des-Monts [48°52'N, 65°58'W], 1 ♂ (CNC); Lac Duparquet Abitibi [48°30'N, 79°13'W], 3 ♂, 3 ♀ (CPAD); La Haute-Gaspésie, Parc de la Gaspésie; Mines Madeleine [48°57'N, 66°01'W], 1 ♂ (CNC); La Rivière-du-Nord, Saint-Hippolyte, Station biologie Université de Montréal [45°59'N, 74°00'W], 1 ♂ (CPAD); Antoine-Labelle, Lac Saguay, hwy 117 [46°32'N, 75°09'W], 1 ♂ (CPAD); Val-d'Or, Vallée-de-l'Or, Louvicourt, hwy 117, km 491 [48°04'N, 77°23'W], 2 ♂, 1 ♀ (CPAD); *Manitoba*: Dauphin [51°09'N, 100°03'W], 1 ♂ (CNC); Riding Mountain National Park North Gate [50°53'N, 100°15'W], 1 ♂, 4 ♀ (CNC); Riding Mountain National Park East Escarpment [50°53'N, 100°15'W], 1 ♂ (CNC); Riverton [50°59'N, 96°59'W], 1 ♂, Wallace Lake [51°00'N, 95°21'W], 1 ♂, 3 ♀ (CNC); *Sas-*

katchewan: Anglin Lake [53°44'N, 105°56'W], 8 ♂, 12 ♀ (DJB); Besnard Lake [55°25'N, 106°00'W], 4 ♂ (DJB); *Alberta*: Blood Indian Reserve 148A [49°03'N, 113°42'W], 1 ♂ (DJB); Waterton National Park [49°04'N, 113°47'W], 7 ♂, 1 ♀ (DJB); Waterton Lakes National Park Cameron Lake [49°01'N, 114°04'W], 2 ♂, 1 ♀ (CNC); Baptiste Lake [54°45'N, 113°35'W], 3 ♂, 3 ♀ (DJB); 19 km N of Calling Lake [55°15'N, 113°12'W], 2 ♂ (DJB); Edmonton [53°33'N, 113°28'W], 1 ♂, 1 ♀ (DJB); 25 km sw Rocky Mountain House [52°22'N, 114°55'W], 6 ♂, 3 ♀ (HAC, DJB); ~20 km s Slave Lake 3 ♂, 1 ♀, [55°23'N, 115°13'W], (CMB); *British Columbia*: Babine Lake [54°45'N, 126°00'W], 1 ♀ (CNC); Cougar Canyon Ecological Reserve Vernon [50°09'N, 119°19'W], 1 ♂ (CNC); 15 mi NE Kamloops [50°40'N, 126°19'W], 1 ♀ (CNC); Pinkut Creek [54°27'N, 125°27'W], 1 ♀ (CNC); Lumby [50°15'N, 118°58'W], 1 ♂ (CNC); Vance Creek Ecological Reserve Vernon [50°17'N, 118°57'W], 1 ♂ (CNC).

Description.—*Female* ($n = 5$): Total length: 2.94 ± 0.23 mm; carapace length: 1.11 ± 0.09 mm; carapace width: 0.89 ± 0.06 mm; carapace smooth, shiny, light orange to orange-brown with radiating line and midline shaded with gray; carapace with diffuse gray margins; 2 long erect setae along midline; sternum light orange shaded with gray. Chelicerae light orange to orange-brown, promargin with 3 large teeth, retromargin with 4–7 denticles. Cheliceral stridulatory organ not visible with stereomicroscope. Abdomen unicolor, light to dark gray, sparsely covered with long erect setae. Legs light orange to orange-brown, tibia I–IV with two dorsal macrosetae; metatarsus I with dorsal trichobothrium, TmI 0.26–0.35, TmIV absent. Epigynum with plate deeply notched, dividing into two protruding lobes; scape long, narrow, slightly widening toward the tip, cochlear present at tip (Figs. 17, 18); spermathecae small, copulatory ducts long, following the folding of the epigynum (Fig. 19).

Distribution.—Widespread boreal species (see also Buckle et al. 2001).

Habitat.—This common species has been collected in forested habitat, under rocks and logs, mainly in deciduous litter and occasionally in coniferous stands.

Remarks.—Ivie (1969) was the first to

place *M. intricatus* in *Lepthyphantes*. In his 1973 paper, however, van Helsdingen overlooked Ivie's paper and erroneously treated it as a new combination.

While *L. intricatus* is similar to other *Lepthyphantes* in its general morphology, the form of both palp and epigynum differ sufficiently from that of *L. minutus*, the type species of *Lepthyphantes*, and from other species of *Lepthyphantes*, sens lat., as to very likely justify its placement in a new genus. This transfer, however, is best left for a future revisional study.

Genus *Scyletria* Bishop & Crosby 1938
Scyletria inflata Bishop & Crosby 1938
 Figs. 20, 21

Scyletria inflata Bishop & Crosby 1938:89, pl. 7 figs. 72–74; Bélanger & Hutchinson 1992:38; Aitchison-Benell & Dondale 1992:224; Buckle et al. 2001:141; Paquin et al. 2001:19; Paquin & Dupérré 2003:118, figs. 1233–1235.

Material examined.—CANADA: *Newfoundland*: The Arches [50°06'N, 57°40'W], 1 ♀ (CNC); *Nova Scotia*: Cape Breton Highlands National Park N of Paquet Lake [46°48'N, 60°41'W], 1 ♀ (CNC); Cape Breton Highlands National Park Lone Shieling [46°48'N, 60°57'W], 1 ♂ (CNC); Cape Breton Highlands National Park Pleasant Bay [49°49'N, 60°48'W], 1 ♂ (CNC); *New Brunswick*: Priceville 12 mi NW Boiestown [46°31'N, 66°17'W], 1 ♀ (CNC); Green River 30 mi N Edmunston [47°19'N, 68°09'W], 4 ♂, 1 ♀ (CNC); 25 km SW Bathurst [47°37'N, 65°37'W], 1 ♀ (CNC); Fredericton [45°56'N, 66°40'W], 1 ♂ (CNC); *Québec*: Îles-de-la-Madeleine Grosse-Île [47°37'N, 61°31'W], 1 ♀ (CNC); St-Méthode [48°43'N, 72°24'W], 1 ♀ (CNC); St-Hippolyte [45°31'N, 73°41'W], 2 ♂ (CNC); Baie-James; Jamésie [49°43'N, 79°17'W], 2 ♀ (CPAD); *Ontario*: Spruce River Sturgeon Lake 42 mi N of Hurkett [50°23'N, 92°30'W], 1 ♀ (CNC); *Manitoba*: Duck Mountain National Park Cowan Creek [52°01'N, 100°38'W], 1 ♀ (CNC); Riding Mountain National Park Swanson spring [50°53'N, 100°15'W], 1 ♂ (CNC); Riding Mountain National Park Jackfish Creek [50°45'N, 100°14'W], 4 ♂, 2 ♀ (CNC); Fort Churchill [58°45'N, 94°04'W], 2 ♂ (CNC); *Saskatchewan*: Lady Lake [52°02'N, 102°37'W], 13 ♂, 7 ♀ (DJB); *Alberta*: Wenzel Lake [59°02'N, 114°28'W], 2 ♂, 1 ♀

(UASM); Cypress Hills Provincial Park Elkwater Lake [49°40'N, 110°17'W], 2 ♀ (CNC); Athabasca [54°43'N, 113°17'W], 2 ♂ (DJB); Baptiste Lake [54°45'N, 113°35'W], 5 ♂, 5 ♀ (DJB); George Lake 16 km W Busby [53°57'N, 114°06'W], 1 ♂ (AG); Winagami Provincial Park [55°36'N, 116°40'W], 1 ♀ (DJB); *Northwest Territories*: Harris River Fort Simpson [61°51'N, 121°20'W], 1 ♂ (CNC).

Description.—*Female* ($n = 5$): Total length: 1.65 ± 0.16 mm; carapace length: 0.68 ± 0.05 mm; carapace width: 0.48 ± 0.05 mm; carapace smooth, shiny, light brown to dark brown with diffused gray patterns along radiating lines and midline; carapace margin darker strongly shaded with gray; 4–5 erect setae along midline; sternum dark brown to almost black, shaded with gray. Chelicerae yellow to light brown, promargin with 4–5 large teeth, retromargin with 4–5 denticles. Cheliceral stridulatory organ visible, weak, ~13 ridges. Abdomen unicolor, gray to dark gray, densely covered with short semi-erect setae. Legs light brown to brown, tibia I–III with two dorsal macrosetae and tibia IV with one dorsal seta; metatarsus I with dorsal trichobothrium, TmI 0.43–0.56, TmIV absent. Epigynum with plate extended posteriad over the epigastric furrow, wider than long, divided into two rounded blunt prominences (Fig. 20); spermathecae small, widely separated, situated near the anterior margin of the epigynal plate (Figs. 20, 21).

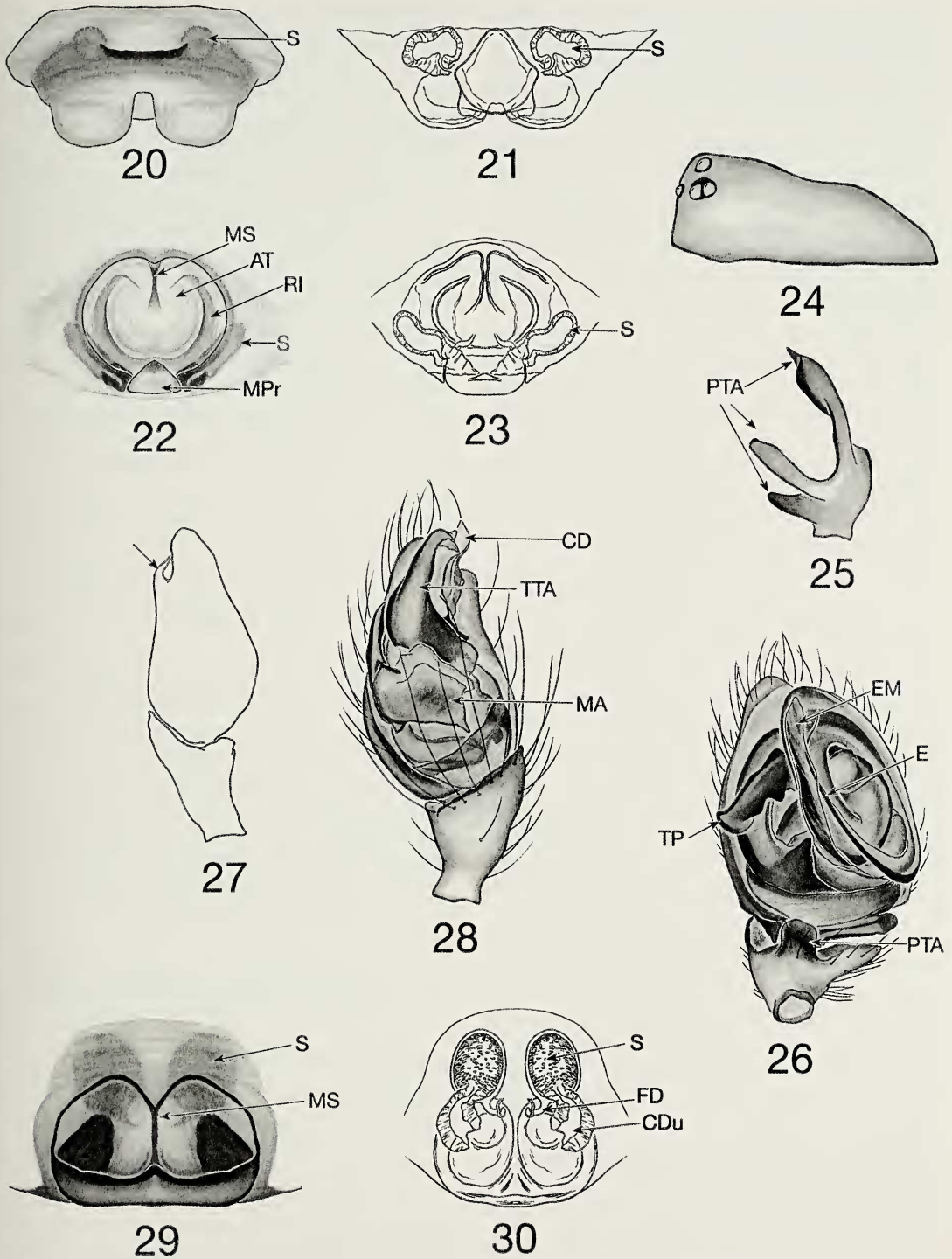
Distribution.—This species is widely distributed in northern North America and is also found in New York and North Carolina in the east (Buckle et al. 2001).

Habitat.—*Scyletria inflata* has been recorded from a wide range of habitats: moss and litter in coniferous forest, moss and algal mats near beaches, riparian vegetation, in conifers and river banks.

Remarks.—The female illustrated under the name *Cephaletus birostrum* Chamberlin & Ivie 1947: fig. 21 (now placed in *Savignia*) appears very similar to *S. inflata*.

Genus *Sisicus* Bishop & Crosby 1938
Sisicus penifusifer Bishop & Crosby 1938
 Figs. 22, 23

Sisicus penifusiferus Bishop & Crosby 1938:62, pl. 2 figs. 12, 13; Levi & Field 1954:448; Drew 1967:172; West et al. 1984:87; Jennings et al.



Figures 20–30.—Linyphiid and theridiid structures: 20, 21. *Scyletria inflata*: 20. Epigynum, ventral view; 21. Spermathecae, dorsal view. 22, 23. *Sisicus penifusifer*: 22. Epigynum, ventral view; 23. Spermathecae, dorsal view. 24–26. *Walckenaeria clavipalpis*: 24. Carapace of male, lateral view; 25. Palpal tibia of male, dorsal view; 26. Palpus of male, ventral view. 27, 28. *Robertus crosbyi*: 27. Palpus of male, cymbium and tibia, dorsal view; 28. Palpus of male, ventral view. 29, 30. *Thymoites minnesota*: 29. Epigynum, ventral view; 30. Spermathecae, dorsal view. Abbreviations used: AT = Atrium, CD = Conductor, CDu = Copulatory Ducts, E = Embolus, EM = Embolic Membrane, FD = Fertilization Ducts, MA = Median Apophysis, MPr = Median Process, MS = Median Septum, PTA = Palpal Tibia Apophysis, RI = Rim, S = Spermatheca, TTA = Theridiid Terminal Apophysis, TP = Tail piece.

1988:61; Aitchison-Benell & Dondale 1992:224; B elanger & Hutchinson 1992:38.

Sisicus penifusifer Bishop & Crosby: Buckle et al. 2001:142; Paquin et al. 2001:19; Paquin & Duperr e 2003:148, figs. 1639–1640.

Material examined.—CANADA: *Newfoundland*: Lloyds River [48°32'N, 57°13'W], 2 ♀ (CNC); Trout River w of Badger [48°59'N, 56°02'W], 2 ♂, 4 ♀ (CNC); Pasadena [49°01'N, 57°36'W], 3 ♀ (CNC); *Nova Scotia*: Cape Breton Highlands National Park Franey Mountain [46°41'N, 60°28'W], 2 ♂, 2 ♀ (CNC); Cape Breton Highlands National Park MacKenzie Mountain [46°46'N, 60°49'W], 3 ♀ (CNC); Cape Breton Highlands National Park Lone Shieling [46°48'N, 60°57'W], 1 ♂, 4 ♀ (CNC); Cape Breton Highlands National Park Beulack Ball Falls [46°44'N, 60°38'W], 1 ♂, 1 ♀ (CNC); Cape Breton Highlands National Park Black Brook [46°44'N, 60°38], 2 ♀ (CNC); Bridgewater [49°17'N, 122°54'W], 5 ♂ (CNC); *New Brunswick*: Fredericton [45°56'N, 66°40'W], 2 ♂, 2 ♀ (CNC); Kouchibouguac National Park [46°51'N, 64°58'W], 7 ♀ (CNC); *Qu ebec*: Forillon National Park [48°54'N, 64°21'W], 1 ♀ (CNC); Gatineau Park King Mountain [45°29'N, 75°52'W], 1 ♀ (CNC); Cedarville [45°01'N, 72°13'W], 1 ♀ (CNC); Maskinong e, Sainte-Ang ele-de-Pr emont [46°21'N, 73°03'W], 1 ♀ (CNC); Baie-James, Jam esie, Val Paradis [49°16'N, 79°08'W], 3 ♀ (CPAD); Pontiac, Les Collines-de-l'Outaouais, 2 km North of Eardley [45°34'N, 76°05'W], 1 ♂ (CPAD); Abitibi-Ouest, Duparquet [48°30'N, 79°14'W], 1 ♂, 1 ♀ (CPAD); Kazabazua, La Vall ee-de-la-Gatineau, Lac Danford [45°57'N, 76°08'W], 1 ♀ (CPAD); *Ontario*: Huntsville [45°20'N, 79°13'W], 1 ♀ (CNC); Ottawa [46°16'N, 75°45'W], 1 ♀ (CNC); Kinburn [43°23'N, 76°11'W], 5 ♀ (CNC); Christie Lake [44°49'N, 76°25'W], 1 ♀ (CNC); Gower [45°08'N, 75°43'W], 1 ♂ (CNC); *Manitoba*: Turtle Mountain [49°03'N, 100°08'W], 5 ♀ (CNC); *Saskatchewan*: Beaver Creek 15 mi S Saskatoon [51°55'N, 106°43'W], 1 ♂, 1 ♀ (CNC); *Alberta*: Edmonton [53°33'N, 113°28'W], 2 ♂, 1 ♀ (CNC); *British Columbia*: Gold Stream Park Vancouver Island [48°28'N, 123°33'W], 1 ♂, 1 ♀ (CNC); Burton [49°59'N, 117°53'W], 3 ♀ (CNC).

Description.—*Female* ($n = 5$): Total length: 1.08 ± 0.11 mm; carapace length: 0.49

± 0.04 mm; carapace width: 0.33 ± 0.04 mm; carapace smooth, shiny, light yellow to light brown, sometimes with diffused gray markings; 5–6 erect setae along midline; sternum light yellow slightly shaded with gray. Chelicerae yellow to light brown, promargin with 4–5 large teeth, retromargin with 5 denticles. Cheliceral stridulatory organ not visible with stereomicroscope. Abdomen unicolor, off-white to light yellow, densely covered with long semi-erect setae. Legs light yellow to light brown, tibia I–II with two dorsal macrosetae and tibia III–IV with one dorsal seta; metatarsus I with dorsal trichobothrium, TmI 0.27–0.38, TmIV absent. Epigynum with atrium broad, deep, almost round; median septum slender, short, extending one-half length of atrium; presence of a rim along side of atrium; (Fig. 22); posterior end of epigynal plate rising, recurving into a median triangular process; spermathecae elongated reaching one-half length of atrium (Figs. 22, 23).

Distribution.—Widespread species in Canada, from British Columbia to Qu ebec and the northern states of USA.

Habitat.—*Sisicus penifusifer* has been mainly collected in forest litter (deciduous and coniferous), under logs, in duff and moss.

Remarks.—The original description of the species includes a description and illustrations of the male, but also a short description of the female which is not mentioned by Platnick (2004). Bishop & Crosby (1938) did not, however, include any illustrations of the female epigynum which is shown here for the first time.

Genus *Walckenaeria* Blackwall 1833
Walckenaeria clavipalpis Millidge 1983
Figs. 24–26

Walckenaeria clavipalpe Millidge 1983:135, figs. 95, 117, 118.

Walckenaeria clavipalpis Millidge: Paquin et al. 2000:272; Paquin & LeSage 2001:101; Buckle et al. 2001:149; Paquin et al. 2001:20; Paquin & Duperr e 2003:125, figs. 1319–1322.

Material examined.—CANADA: *Newfoundland*: Gros Morne National Park Stanford River [49°41'N, 57°44'W], 1 ♀ (RPC); Gros Morne National Park east 1 ♀ Main River West [49°41'N, 57°44'W], 3 ♂ (RPC); Port-au-Choix [50°42'N, 57°22'W], 2 ♂, 1 ♀ (RPC); *Qu ebec*: R eserve faunique des Laurentides [47°41'N, 70°51'W], 1 ♂, 1 ♀

(MLC); La Haute-Gaspésie, Parc de la Gaspésie; Mines Madeleine [48°57'N, 66°01'W], 2 ♂ (CNC).

Description.—*Male* ($n = 1$): Total length: 2.55 mm; carapace length: 1.05 mm; carapace width: 0.85 mm; carapace dark brown, radiating lines and cephalic groove darker brown, midline shaded with black; sternum dark brown, margin darker; cephalic horn absent (Fig. 24). Chelicerae brown, promargin with 3 large teeth and 1 small tooth, retromargin with 2–3 denticles. Cheliceral stridulatory organ easily visible, well developed, ~11 ridges widely separated. Abdomen unicolor, dark gray, densely covered with medium length semi-erect setae. Legs orange, tibia I–II with two dorsal macrosetae and tibia III–IV with one dorsal seta; metatarsus I with dorsal trichothorium, TmI 0.49, TmIV absent. Palpal tibia with four apophyses (3 dorsal, 1 ventral) (Fig. 25); tail piece long, apex billhook shaped; embolus long, coiled, covering 3/4 of the genital bulb length; embolic membrane long, narrow, covering 3/4 of the genital bulb length (Fig. 26).

Distribution.—This rare species was known only from Mt Whiteface (New York) (Millidge 1983), the type locality, and the Gaspésie Park (Québec). Based on these records, the species was tentatively placed in the Alpine-Appalachian category (*sensu* LeSage & Paquin 2001) by Paquin et al. (2000). The records given here provide additional support for this placement as both localities confirm the alpine and Appalachian affinities of the species.

Habitat.—Coniferous forest litter on the summits of North-East North America; ~500 m and higher.

Family Theridiidae Sundevall 1833

Genus *Robertus* O. Pickard-Cambridge
1879

Robertus crosbyi (Kaston 1946)

Figs. 27, 28

Ctenium crosbyi Kaston 1946:7, fig. 52.

Robertus crosbyi (Kaston 1946): Brignoli 1983: 411; Aitchison-Benell & Dondale 1992:219, Bélanger & Hutchinson 1992:81; Paquin et al. 2001: 24; Paquin & Dupérré 2003:218, figs. 2435–2437.

Material examined.—CANADA: *Québec*: Rivière-du-Loup, Île Verte [47°50'N, 69°32'W], 6 ♂, 6 ♀ (CNC); Pontiac, Les Col-

lines-de-l'Outaouais, Parc de la Gatineau, Lac Brown [45°36'N, 75°55'W], 1 ♂ (CNC); Îles-de-la-Madeleine [47°24'N, 61°47'W], 1 ♀ (CNC); *Manitoba*: Riding Mountain National Park [46°41'N, 60°28'W], 1 ♀ (CNC); *Alberta*: Athabasca [54°45'N, 113°35'W], 1 ♀ (DJB).

Description.—*Male* ($n = 3$): Total length: 2.31 ± 0.06 mm; carapace length: 1.13 ± 0.07 mm; carapace width: 0.92 ± 0.06 mm; carapace smooth, shiny, light brown to dark brown, cephalic groove slightly darker, radiating lines shaded with gray; sternum brown shaded with gray, margin darker. Chelicerae dark. Abdomen unicolor, light gray to dark gray, sparsely covered with long erect setae. Legs light brown. Palpal tibia with one apophysis, cymbium with one lateral apophysis lacking apical setae (Fig. 27). Theridiid terminal apophysis elongated, narrowing into a hook bearing an additional process; median apophysis bearing two basal points, median apophysis projecting toward the apex of the palpus and curving behind the terminal apophysis; conductor sinuate, projecting apically (Fig. 28).

Distribution.—In the original description, Kaston (1946) lists only two records from New York. Based on the few records available, this is a widespread but rarely collected species.

Habitat.—*Robertus crosbyi* seems associated with salt marshes, sea wrack, lakeshore litter and mosses in boggy areas.

Genus *Thymoites* Keyserling 1884

Thymoites minnesota Levi 1964

Figs. 29, 30

Thymoites minnesota Levi 1964:467, figs. 74–76; Levi & Randolph 1975:47; Bélanger & Hutchinson 1992:85; Dondale et al. 1997:78; Paquin et al. 2001:24; Paquin & Dupérré 2003:224 figs. 2509–2511.

Material examined.—U.S.A.: *North Dakota*: Bottineau County [county record only], 1 ♀ (DSU); CANADA: *Nova Scotia*: Lockport [43°42'N, 65°07'W], 1 ♂ (CNC); *New Brunswick*: Sackville [45°55'N, 63°23'W], 1 ♂ (CNC); *Québec*: Saint-Jean-sur-Richelieu, Le Haut-Richelieu, L'Acadie [45°18'N, 73°20'W], 1 ♂, 1 ♀ (CPAD); Rivière-du-Loup, Île Verte [47°50'N, 69°32'W], 4 ♂ (CNC); Îles-de-la-Madeleine [47°24'N, 61°47'W], 1 ♂ (CNC); *Ontario*: Wawa

[47°59'N, 84°47'W], 1 ♀ (CNC); *Saskatchewan*: Lady Lake [52°02'N, 102°37'W], several ♂, several ♀ (MCZ, DJB); St-Denis [52°09'N, 106°07'W], 1 ♂, 1 ♀ (DJB); *Manitoba*: 9 mi W Souris [49°37'N, 100°15'W], 1 ♀ (CNC); *Alberta*: Waterton Lake National Park [49°01'N, 114°04'W], 1 ♂, 2 ♀ (CNC); Wenzel Lake [59°02'N, 114°28'W], 1 ♂ (UASM); 5 mi S Armena [53°07'N, 112°57'W], 1 ♀ (AG); Baptiste Lake [54°45', 113°35'], 1 ♂ (DJB); 7 km W Bittern Lake [53°01'N, 113°03'W], 1 ♂ (AG); *Northwest Territories*: Yellowknife [62°27'N, 114°21'W], 1 ♂ (CNC); *Yukon Territory*: Old Crow [67°35'N, 137°53'W], 1 ♀ (CNC).

Description.—*Male* ($n = 5$): Total length: 2.18 ± 0.32 mm; carapace length: 0.77 ± 0.01 mm; carapace width: 0.76 ± 0.02 mm; carapace shiny, yellow with a tinge of orange, gray to black band along midline and along the second half of carapace margin; chelicerae light yellow to yellow; sternum yellow with a tinge of orange, margin shaded with gray. Abdomen unicolor, off-white or off-white with random pattern of white pigment, sparsely covered with decumbent setae; ventral side of abdomen often with a gray to black triangular mark above the spinnerets and two oval markings on each side of the epigynum. Legs yellow-orange. Epigynal plate with atrium, deep, divided in two by a complete median septum; posterior margin of plate rising and forming a ledge connecting with the median septum (Fig. 29); copulatory ducts large, spermathecae oval, situated at anterior margin of the epigynal plate (Figs. 29, 30).

Distribution.—Widespread northern species.

Habitat.—*Thymoites minnesota* has been recorded from limestone outcrops, moss, freshwater sedge marshes, salt marshes, and a male and female were collected in a pitfall trap in a cultivated field in L'Acadie (Québec).

DISCUSSION

Couples *in copula* are rarely used as a reference for matching the sexes of a given species. Usually, we rely on the co-occurrence of two sexes in the same sample, or the occurrence of an unmatched sex in a precise region or habitat in which only one species of a given genus is known. Although these practices may lead to incorrect matches of sexes, most associations were done using these simple meth-

ods, resulting in a very low number of mis-associations. In almost all the present cases, at least one couple was collected together in a given sample, thereby, facilitating the correct associations between the sexes. Also, the fauna of the Québec region is well known, therefore limiting the possibilities of a mismatch (see Bélanger & Hutchinson 1992; Paquin et al. 2001).

Knowledge of spider fauna is highly dependent on museum collections that gathered specimens from several types of surveys and biodiversity studies. In the present case, examination of material preserved in museums and private collections allowed us to fill some gaps for species descriptions. The accessibility of such material was essential to this study. Museum specimens provide not only precious information about specimens, but may also be used to orient further collecting to discover an unknown sex or to collect fresh specimens for DNA studies.

ACKNOWLEDGMENTS

We wish to express our gratitude to C.D. Dondale and J.H. Redner for allowing us to use the material deposited in the CNC and benefit from their years of work on Linyphiidae. We also would like to thank J. Miller for suggestions and comments on an earlier draft of this manuscript, I. Agnarson for clarifying the terminology in use for theridiid palps, M. Larivée and R. Pickavance for sharing data on *W. clavipalpis*, C. Vink for grammatical improvements and G. Hormiga and M. Harvey for their comments and review.

LITERATURE CITED

- Aitchison, C.W. & G.D. Sutherland. 2000. Diversity of forest upland arachnid communities in Manitoba taiga (Araneae, Opiliones). *The Canadian Field-Naturalist* 114:636–651.
- Aitchison-Benell, C.W. & C.D. Dondale. 1992 [“1990”]. A checklist of Manitoba spiders (Araneae) with notes on geographic relationships. *Le Naturaliste Canadien* 117(4):215–237.
- Banks, N. 1892. The spider fauna of the Upper Cayuga Lake Basin. *Proceedings of the Academy of Natural Sciences of Philadelphia* 1:11–81 + pl. I–V.
- Banks, N. 1916. A revision of Cayuga Lake spiders. *Proceedings of the Academy of Natural Sciences of Philadelphia* 68:68–84.
- Bélanger, G. & R. Hutchinson. 1992. Liste annotée des Araignées (Araneae) du Québec. *Pirata* 1(1): 2–119.

- Bishop, S.R. & C.R. Crosby. 1935a. Studies in American spiders: miscellaneous genera of Eri-goneae. Part I. Journal of the New York Entomological Society 43(2):217–241, 43(3): 255–281.
- Bishop, S.R. & C.R. Crosby. 1935b. American Eri-goninae: the spider genera *Pelecopsidis* and *Floricomus*. Journal of the New York Entomological Society 43(1):31–45.
- Bishop, S.R. & C.R. Crosby. 1938. Studies in American Spiders: miscellaneous genera of Eri-goninae, part II. Journal of the New York Entomological Society 46(1):55–107.
- Brignoli, P.M. 1983. A catalogue of the Araneae described between 1940 and 1981 (edited by P. Merrett). Manchester University Press in association with the British Arachnological Society vii-xi + 1–755 pages.
- Buddle, C.M., J.R. Spence & D.W. Langor. 2000. Succession of boreal forest spider assemblages following wildfire and harvesting. Ecography 23: 424–436.
- Buckle, D.J., D. Carroll, R.L. Crawford & V.D. Roth. 2001. Linyphiidae and Pimoidae of America north of Mexico: Checklist, synonymy, and literature. Pp. 89–191. In Contributions à la connaissance des Araignées (Araneae) d'Amérique du Nord (P. Paquin & D.J. Buckle eds.). Fabriques, Supplément 10.
- Chamberlin, R.V. 1949 ["1948"]. On some American spiders of the family Eri-gonidae. Annals of the Entomological Society of America 41(4): 483–562.
- Chamberlin, R.V. & W. Ivie. 1944. Spiders of the Georgia region of North America. Bulletin of the University of Utah 35(9). Biological Series 8(5): 1–267.
- Chamberlin, R.V. & W. Ivie. 1947. The spiders of Alaska. Bulletin of the University of Utah 37(10). Biological Series 10(3):5–103.
- Denis, J. 1949. Notes sur les Éri-gonides. XVI. Essai sur la détermination des femelles d'éri-gonides. Bulletin de la Société d'Histoire Naturelle de Toulouse 83:129–158.
- Dondale, C.D. & D.J. Buckle. 2001. The genus *Maro* in North America (Araneae: Linyphiidae). Fabriques 26(1):9–15.
- Dondale, C.D. & J.H. Redner. 1994. Spiders (Araneae) of six small peatlands in southern Ontario or southwestern Quebec. Memoirs of the Entomological Society of Canada 169:33–40.
- Dondale, C.D., J.H. Redner & Y.M. Marusik. 1997. Spiders (Araneae) of the Yukon Territory. Pp. 73–113. In Insects of the Yukon (H.V. Danks & J.A. Downes eds.). Biological Survey of Canada Monograph series. No. 2. Biological Survey of Canada (Terrestrial Arthropods). Ottawa.
- Drew, L.C. 1967. Spiders of Beaver Island, Michigan. Publications of the Museum, Michigan State University, Biological Series 3(3):153–207.
- Emerton, J.H. 1882. New England spiders of the family Theridiidae. Transactions of the Connecticut Academy of Arts and Sciences 6:1–86.
- Emerton, J.H. 1911. New Spiders from New England. Transactions of the Connecticut Academy of Arts and Sciences 16:385–407.
- Emerton, J.H. 1923. New spiders from Canada and the adjoining states, No. 3. Canadian Entomologist 55(10):238–243.
- Freitag, R., G.W. Ozburn & R.E. Leech. 1969. The effects of Sumithion and Phosphamidon on populations of five carabid beetles and the spider *Trochosa terricola* in northwestern Ontario and including a list of collected species of carabid beetles and spiders. Canadian Entomologist 101(12):1328–1333.
- Gertsch, W.J. 1992. Distribution patterns and speciation in North American cave spiders with a list of the troglobites and revision of the cicurinas of the subgenus *Cicurella*. Texas Memorial Museum, Speleological Monographs 3:75–122.
- Hackman, W. 1954. The spiders of Newfoundland. Acta Zoologica Fennica 79:1–99.
- van Helsdingen, P.J. 1973. A recapitulation of the Nearctic species of *Centromerus* Dahl (Araneida, Linyphiidae) with remarks on *Tunagyna debilis* (Banks). Zoologische Verhandelingen Rijksmuseum van Natuurlijke Historie te Leiden 124:1–45.
- Hormiga, G. 1994. Cladistics and the comparative morphology of linyphiid spiders and their relatives (Araneae, Araneioidea, Linyphiidae). Zoological Journal of the Linnean Society, 111:1–71.
- Holm, Å. 1968. A contribution to the spider fauna of Sweden. Zoologiska Bidrag fran Uppsala 37: 183–209.
- Hutchinson, R. 1994. Contribution à la connaissance des Araignées (Araneae) de la région de Port-au-Saumon (Charlevoix-Est), de Tadoussac et des Escoumins (Saguenay). Pirata 1(2):157–201.
- Ivie, W. 1969. North American spiders of the genus *Bathypantes* (Araneae, Linyphiidae). American Museum Novitates 2364:1–70.
- Jennings, D.T., M.W. Houseweart, C.D. Dondale & J.H. Redner. 1988. Spiders (Araneae) associated with strip-clearcut and dense spruce-fir forests of Maine. Journal of Arachnology 16:55–70.
- Kaston, B.J. 1946. North American spiders of the genus *Ctenium*. American Museum Novitates 1306:1–19.
- Koponen, S. 1987. Communities of ground-living spiders in six habitats on a mountain in Quebec, Canada. Holarctic Ecology 10:275–285.
- LeSage, L. & P. Paquin. 2001 ["2000"]. Historique, géographie physique et biogéographie du parc de conservation de la Gaspésie, Québec. Proceed-

- ings of the Entomological Society of Ontario 131:17–66.
- Levi, H.W. 1964. The spider genus *Thymoites* in America (Araneae: Theridiidae). Bulletin of the Museum of Comparative Zoology 130(7):447–479.
- Levi, H.W. & H.M. Field. 1954. The spiders of Wisconsin. American Midland Naturalist 51: 440–467.
- Levi, H.W. & L.R. Levi. 1955. Spiders and harvestmen from Waterton and Glacier National Parks. Canadian Field-Naturalist 69(2):32–40.
- Levi, H.W. & D.E. Randolph. 1975. A key and checklist of American spiders of the family Theridiidae north of Mexico (Araneae). Journal of Arachnology 3:31–51.
- Marusik, Y.M., K.Y. Eskov, D.V. Logunov & A.M. Basarukin. 1993 [“1992”]. A check-list of spiders (Arachnida Aranei) from Sakhalin and Kurile Islands. Arthropoda Selecta 1(4):73–85.
- Millidge, A.F. 1983. The erigonine spiders of North America. Part 6. The genus *Walckenaeria* Blackwall (Araneae, Linyphiidae). Journal of Arachnology 11(3):105–200.
- Paquin, P. & N. Dupérré. 2003. Guide d'identification des Araignées (Araneae) du Québec. Fabriques, Supplément 11. 251 pp.
- Paquin, P., N. Dupérré & R. Hutchinson. 2001. Liste révisée des Araignées (Araneae) du Québec. Pp. 5–87. In Contributions à la connaissance des Araignées (Araneae) d'Amérique du Nord (P. Paquin & D.J. Buckle eds.). Fabriques, Supplément 10.
- Paquin, P. & L. LeSage. 2001 [“2000”]. Diversité et biogéographie des Araignées (Araneae) du parc de conservation de la Gaspésie, Québec. Proceedings of the Entomological Society of Ontario 131:67–111.
- Paquin, P., L. LeSage & N. Dupérré. 2000. First Canadian records of *Tenuiphantes cracens* (Zorsch) and *Walckenaeria clavipalpis* Millidge (Araneae: Linyphiidae), and thirteen new provincial records and a confirmation for Quebec. Entomological News 112(4):271–277.
- Peck, S.B. 1988. A review of the cave fauna of Canada, and the composition and ecology of the invertebrate fauna of caves and mines in Ontario. Canadian Journal of Zoology 66:1197–1213.
- Platnick, N.I. 2004. The world spider catalog, version 5.0. American Museum of Natural History. <http://research.amnh.org/entomology/spiders/catalog81-87/index.html>.
- Saaristo, M.I. & A.V. Tanasevitch. 1996. Redelimitation of the subfamily Micronetinae Hull, 1920 and the genus *Lepthyphantes* Menge, 1866 with description of some new genera (Aranei, Linyphiidae). Bericht des Naturwissens-Medizinischen Verein Innsbruck 83:163–186.
- Simon, E. 1926. Les Arachnides de France. Synopsis générale et catalogue des espèces françaises de l'ordre des Araneae. Tome 6, 2ème partie. pp 309–532. Paris.
- West, R., C.D. Dondale, & R.A. Ring. 1984. A revised checklist of the spiders (Araneae) of British Columbia. Journal of the Entomological Society of British Columbia 81:80–98.
- West, R., C.D. Dondale, & R.A. Ring. 1988. Additions to the revised checklist of the spiders (Araneae) of British Columbia. Journal of the Entomological Society of British Columbia 85:77–86.

Manuscript received 12 January 2004, revised 11 November 2004.